

MIFARE SAM START UP GUIDE

Version 1.0

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1. Introduction

MIFARE SAMs (Secure Application Module) have been designed to provide the secure storage of cryptographic keys and cryptographic functions for the terminals to access the various types of NXP cards.

There are the two types of NXP SAM supported: T1AD2060, and T1AR1070.

1.2. Basic requirements

- uFR Classic CS with SAM reader
- NXP SAM card inserted into connector
- Firmware version 5.100.xxx

2. Applications and code examples

2.1. SAM tool

This is application for key management when the SAM is in AV2 mode, or for personalization and switch into AV2 mode if SAM is in AV1 mode .

Our SAM cards that come with the readers are in AV2 mode.

All examples works with SAM into AV2 mode.

Using this application can define the keys for working with the SAM itself, as well as for working with Mifare Classic, Mifare Plus, Mifare Desfire and Mifare Ultralight C cards.

Link for application: https://git.d-logic.net/nfc-rfid-reader-sdk/sam_tool-executable.git

Link for user guide of application:

<https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-doc/blob/master/SAM%20tools%20user%20manual.pdf>

2.2. Mifare Desfire console example

This example demonstrated operations with Mifare Desfire card.

Supported operations with DES, 2K3DES, 3K3DES, and AES keys, which are already stored into SAM.

Using this example user may change keys for card (PICC keys), if existing one SAM key (AES Host key) known by user, which has permission to changing PICC keys. For example, Host key number 100 version 10, has permission to change PICC keys number 101, 102, 103, and 104. These keys options, may be set using SAM tool application.

Link for code example: <https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-ds-examples-c>

Link for user guide:

https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-doc/blob/master/uFR_desfire_console_C_example%20.pdf

2.3. Mifare Plus console example

This example demonstrated operations with Mifare Plus card.

Mifare Plus must in SL3 mode, to using AES keys from SAM.

Like in Desfire example, user may change AES PICC keys.

Link for code example: <https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-mfp-examples-c>

2.4. Mifare Ultralight C console example

This example demonstrated operations with Mifare Ultralight C card.

Picc key must be 2K3DES type for Ultralight C card.

Link for code example: <https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-ulc-examples-c>

2.5. Mifare Classic console example

This example demonstrated operations with Mifare Classic card, and Mifare Plus card in SL1 mode, and Mifare Plus card in SL3 mode (Classic compatible mode where AES key calculated from Crypto1 key).

Picc key must be Crypto1 type.

Link for code example: <https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-mf-examples-c>

3. Library documentation

Link for documentation of API functions:

<https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-doc/blob/master/uFR%20Series%20NFC%20reader%20API.pdf>

Link for documentation of serial COM protocol:

https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-doc/blob/master/uFR_COM_Protocol.pdf

All function for card operations, which works with SAM, have word "SAM" into name.



Special functions for SAM operation, explained into chapter “Support for NXP SAM (Secure Application Module)” into API document.

Revision history

Date	Version	Comment
2019-12-03	1.0	Base document